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Transportation and Competitiveness of U.S. Agricultural Products in World Markets

Summary of a Research Symposium, October 1986

TRANSPORTATION AND COMPETITIVENESS OF U.S. AGRICULTURAL PRODUCTS IN WORLD MARKETS: SUMMARY OF A RESEARCH SYMPOSIUM, OCTOBER 1986. Economic Research Service, U.S. Department of Agriculture. Staff Report No. AGES870611.

ABSTRACT

In 1986, transportation services were used to deliver 108 million tons of U.S. agricultural products to overseas customers. Costs of these services represent 15-30 percent of the landed price of exports. Thus, the availability and efficiency of both domestic and international transportation services affect the competitiveness of U.S. agricultural exports in world markets. This report summarizes 17 papers presented at the Transportation and Competitiveness Symposium held by the Economic Research Service in October 1986. The papers focus on both domestic and international transportation issues.

Keywords: Transportation, competitiveness, maritime policies, railroad deregulation, deep draft ports, ocean freight markets, Shipping Act of 1984, ocean freight rates, research priorities

FULL PAPERS AVAILABLE

The 17 papers summarized in this document will be available in full under the title Transportation and Competitiveness of U.S. Agricultural Products in World Markets: Proceedings of a Research Symposium, October 1986. Staff Report AGES870612, Economic Research Service, U.S. Department of Agriculture. For price and ordering instructions, write after September 1 to: Identification Section, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, or call at (703) 487-4780. American Express, MasterCard, VISA, and NTIS Deposit Accounts accepted.

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PREFACE

The competitiveness of agricultural products in world markets depends heavily upon the ability of U.S. exporters to achieve low per unit delivery costs. Transportation is a major component in the total landed cost of exports. Thus, research directed toward solving transportation-related impediments to world trade contributes importantly to ensuring the maintenance and expansion of current markets for U.S. agricultural exports.

The Transportation and Competitiveness Symposium, held in Washington, D.C. on October 14-15, 1986, was a research symposium with primary objectives of inventorying current knowledge about global agricultural transportation issues and identifying research priorities. The conference, attended by representatives of academia, government agencies, and private groups, was an additional step in understanding competitiveness and how we compete in world agricultural markets.

The symposium produced 17 invited papers, discussing domestic and international transportation issues. These papers are summarized here along with symposium participants' suggestions on research needs.

ACKNOWLEDGMENTS

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INTRODUCTION 1/

Velmar W. Davis

U.S. agricultural exporters depend upon transportation systems to deliver their products to foreign markets. These systems can be divided into three sectors: U.S. domestic, intercontinental, and overseas. The efficiency and quality of service provided by all three sectors and the efficiency with which they interact are major determinants of export volume.

The volume of U.S. agricultural exports, 108 million tons in 1986, indicates the quantity of domestic and international service required to deliver these products. The importance of agricultural exports can be seen in the value of these goods: $26 billion in 1986. Transportation costs represent 15-30 percent of the landed cost of exports. Thus, effective management of transportation functions contributes significantly to the maintenance and expansion of foreign markets for U.S. farm products.

Roles of the Transportation Modes

Agricultural products are transported by every mode except pipeline. Export shipments require coordination of at least two and often more modes to move commodities from the field to foreign customers.

The majority of U.S. farm exports are bulk raw commodities. Grains, oilseeds, feeds, and meals accounted for 92 percent of U.S. export volume in 1986. These commodities are typically shipped unpackaged, but some move in bags or drums. While most of the bulk shipments arrive at ports in railcars of 100 tons capacity or in barges carrying 1,500 tons each, trucks play a significant role at some ports near production areas or processing facilities. As a result of consolidation of the rail industry, export shipments increasingly involve only a single railroad. However, all shipments of grain, cotton, and other crops leave the farm in trucks. Most such shipments are later loaded into railcars or barges for further movement. A number of transportation-related companies have developed partly to coordinate between

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1/ Based on material provided by Kay L. McLennan, Office of Management and Budget, formerly with ERS, and T. Q. Hutchinson, ERS.

modes. These enterprises arrange for transportation and grading, and often provide storage and packing or processing facilities. They also provide the usually unrecognized, but most necessary, servicing of the large volume of paperwork required for goods to leave the United States and be accepted at a foreign destination.

Ocean bulk carriers are usually of two types: tramps and liners. Liners, with published rates for manufactured goods and for small quantities of bulk commodities, usually offer a scheduled service with regular ports-of-call. Tramps essentially lease themselves to a shipper for one or more voyages or for a fixed period. Tramp rates are negotiated between a shipper and an owner, often with an intermediary broker. The great majority of all bulk cargoes move in tramp ships.

Liners can be further classified by two types: traditional and container ships. The traditional liner design has remained basically unchanged since the turn of the century. But, container ships have a relatively new design. These carry van containers which can be placed on railcars or trucks for movement toward or away from dockside. A major benefit of these ships lies in the speed with which a container ship can be loaded and unloaded, substantially saving costs. Such savings are amplified by the fact that containers can be handled by a single crane operator. Conventional ships require relatively large groups of longshoremen. For a variety of reasons, container ships have come to dominate the breakbulk trades.2/ A majority of the high-value or highly perishable agricultural exports move in container ships.

More than a third of the world's merchant fleet is in surplus. As a result, freight rates are depressed and some steamship lines are either bankrupt or out of business entirely. This surplus situation is partly due to shipbuilding programs sponsored by foreign governments.

The U.S. domestic transportation system also has surplus capacity. Railroads and barges both expanded to meet the large grain exports of the late seventies and early eighties. When demand fell, the cars and barges remained.

Airlines also play a role in exporting. Some high-value, perishable agricultural products such as live animals, nursery products, and some fresh fruits and vegetables move by air. Less than 1 percent of total farm exports are transported by air, but 75 percent of U.S. livestock exports are shipped overseas by this mode.

Impediments to Transport of U.S. Agricultural Products

A number of potential impediments to efficient movement of agricultural goods can be postulated. Some were investigated by symposium participants. Others remain as opportunities for research.

While the U.S. transportation infrastructure is highly developed, that of many of our trading partners is much less developed. The costs and benefits of improving or, in some instances, creating ports, docks, railways, highways,

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2/ Breakbulk cargo is defined as heterogeneous items of general cargo, packaged and moved as single parcels or assembled together on pallet boards and wire or rope cargo slings as a means of lifting on and off a vessel by ship's gear or by wharf cranes.

and bridges are generally unknown. In many instances, however, the transportation infrastructure overseas is a major barrier to market development. Adequacy of existing highways and bridges is in question even in the United States. Maintenance has been deficient sometimes and there is concern that the network could begin to shrink.

The surplus of ocean shipping capacity has made many nations adopt protection policies, requiring a fixed share of that nation's commerce to be carried in vessels flying the nation's flag. The resulting partial monoply likely increases freight rates on the trades involved. Such increases in turn could lead to further increases in capacity. The net result could embrace very low rates for unprotected vessels and high rates for shippers in nations practicing such protection.

U.S. policy calls for user chargers for government-aided facilities and services. Such charges do not enhance market development in the short run. Modest user charges, however, should create no lasting barriers and have a potential to bring about needed long-term investment in facilities.

In 1980, the United States substantially deregulated the rail and truck industries. Results of these actions are not clear because the dynamics of regulations have not yet run their course. The combination of lessened regulation and excess capacity has created a move toward rail consolidation. These consolidated firms appear to be branching out into the barge and truck theaters. Transportation companies offering multimodal service (including ocean transportation) already exist and could come to be the norm. Whether such enterprises constitute barrier or enhancement to market development is yet unclear.

SUMMARY OF PAPERS ON EFFECTS OF MARKET AND INFRASTRUCTURE CHANGES ON THE U.S. DOMESTIC TRANSPORTATION SYSTEM

Velmar W. Davis

Research Issues in Grain Transportation

Robert J. Hauser and C. Phillip Baumel described the grain transport industry serving U.S. export ports in terms of empirical measures of competitiveness. Then, they identified current research issues in grain transportation.

An important factor affecting grain rail rates during the past 10 years has been the level of barge rates. Barge rates for grain shipments peaked in 1979-80, then generally declined during the next 4 years. As a competing mode to rail, barge shipments became a more attractive transport alternative to shippers, creating downward pressure on rail rates.

Some of Hauser's (1985, 1986) findings based on estimates of "net prices" were reviewed to gain insight on the effect of the decrease in barge rates on rail shipments. A net price for a given grain origin is the grain price offered at a destination minus the cost of transportation from the origin to the destination.

Another descriptor of competition is the ratio of rail rate to variable cost (R-VC). The economic rationale for using the R-VC ratio as a standard of competitiveness is that firms within a competitive industry face fairly

elastic demands, causing their R-VC to be small, whereas relatively large R-VCs are exhibited in noncompetitive industries due to the firms' inelastic demands.

The results of the analyses of net price and R-VC's suggest that the competitive level for export grain shipments was generally high, given the market conditions of 1978-83. Relevant rail rates were observable during this period because virtually all of the grain rail traffic used published tariff rates. However, the use of private contracts between shippers or receivers and rail carriers has increased dramatically since 1982.

Hauser and Baumel concluded by offering some research priorities. The highest priority issue follows from the premise that market conditions as well as rail rates will change and that the rate level is of central importance to policy decisions. Yet, models for explaining and particularly for projecting grain rail rates are virtually nonexistent. Perhaps the principal reason for this void is that the regulation policies of the pre-Staggers era discouraged rate analysis in a neoclassical supply/demand framework. Market forces, however, are now more important and the need to monitor and project their effects are as important if not more important than ever. The set of research issues assigned second priority involves (a) the incidence of benefits and costs on farmers and shippers caused by confidential contract rates and (2) the prevelancy and effects of nonparticipation in switching agreements and joint rates. The third area of research includes examination of (1) the comparative advantage effects of rate regulation, (2) the efficiency implications of an exchange system utilizing private contracts versus published tariffs versus untried systems, and (3) competitiveness goals and the tradeoffs involved when considering rate constraints versus freely determined market rates.

Railroad Deregulation: Overview and Issues

L. Orlo Sorenson presented an overview of regulatory conditions prior to passage of Staggers Act. He identified observed and likely effects of the act, and listed some priority research issues.

Early railroad regulation had four objectives: (1) to control monopoly practices, (2) to protect shippers and other carriers from unfair discrimination by railroads, (3) to make available transport services consistent with a perceived public need, and (4) to maintain a financially viable and growing rail transportation system.

Economic benefits were to be realized in all sectors of the economy as each of the objectives were advanced. Regulation was also structured around the common carrier tenets of equity or fairness to participants and public service on the part of those carriers authorized to provide service. As regulation developed over time, control of rail operation by the Interstate Commerce Commission (ICC) became more and more pervasive. Administrative extensions of the regulatory mandate were justified largely as a necessary means of avoiding (1) discrimination among shippers and (2) unfair treatment of competing carriers.

In the seventies, there was concern about a rural transportation crisis that centered on the performance of the railroads. It was increasingly apparent that the market rules by which railroads were managed were not working. Earnings by railroads were unacceptable despite the essential need for their services. Bankruptcies were frequent among carriers and complaints of inadequate service were rampant.

Changes in agricultural transportation in the eighties reflect many conditions, only one of which was rail deregulation. A list of major changes follows:

- The periodic (nearly continuous) crises in rural transportation of the seventies have not been prominent in the eighties. Rural transportation crises had three rail dimensions: (1) availability of freight cars, (2) condition of rail lines on which maintenance had been deferred, and (3) abandonment of rail service on low density branch lines.

- A second eighties' change is the very important structural reorganization of railroads. End-to-end mergers in the West have been very important in providing single line service from many local origins for shipment of agricultural products.

- Perhaps the most significant change in rail transport for agriculture has been the flexibility of individual rail companies in pricing and marketing their services. The three regulatory features that changed to permit almost unrestricted rate-making activity by individual railroad firms were: (1) restrictions placed on rate-making authority of carrier rate bureaus, (2) authorization of contracts, and (3) shifting the burden of proof to the protestant in contested rate cases.

- Another observation is the absence of an anticipated post-Staggers development. Rail share or rail service quality for transport of agriculture's produce other than grain appears not to have been improved. Long-haul bulk movement of agricultural products that railroads have hauled in the past includes fresh produce and red meat.

- The public view of railroads has shifted from that of quasi-public agencies subject to common carrier and public service responsibilities to that of a business enterprise with little, if any, public service responsibility. Consistent with these changes, service obligations of carriers are not enforced as before.

The new environment in rail transportation suggests several areas in which economic understanding needs to be improved. Sorenson listed the following:

- The nature of geographic and market competition within the railroad system. Rate developments in the Great Plains since deregulation strongly suggest introduction of a new dimension of interrail competition.

- The effects of relative rate changes on agriculture. Interregional competition and product distribution patterns are highly influenced by transportation rate patterns. Evidence suggests that relative shifts in rates may have been fairly large.

- The evolving competitive structure of the railroad system and its effects on agriculture. This involves more than the merger of major systems. Economic savings are reported for shortline railroads over branchline operation. If the movement to short lines is in fact broadly based, this will be important to near-future patterns of rail service in local communities.

- Market access issues exemplified by reciprocal switching and freight interchange concerns. This is a reported problem in grain markets. But,

there is simply not enough information available to tell if switch charge barriers to interline movement is only a nuisance for large grain shippers or if it is a serious impediment to market access.

- Effects of shipper/carrier contracts on structure and performance of grain marketing agencies.

- Virtual absence of railroads in the transport of fresh meat and fruits and vegetables. Railroads appear to border on being competitive with trucks.

Developments in Grain Rail Rates and Services Since Deregulation

James M. MacDonald suggested that an assessment of the impact of rail deregulation faces three major barriers. First, serious data problems must be surmounted. That is, the Staggers Act expanded the use of negotiated contracts between carriers and shippers in which contract rates are confidential. According to the Association of the American Railroads, 57 percent of grain traffic moved under contracts in 1985.

Second, one must separately account for the effects of two major events that have occurred concurrently with deregulation. Export volumes of grain have declined sharply from their 1980-81 peaks, placing downward pressure on rail and barge rates. At the same time, wheat traffic has shifted rapidly in the eighties from a system based predominantly on single car shipments to one based on multiple car and unit train shipments, lowering railroad costs and rates. Each event has had separate effects on rates. Analysis is further complicated because deregulation may also have hastened the shift away from single car shipments and may have increased the responsiveness of rail rates to export volumes.

The third barrier is conceptual and affects our efforts to interpret the empirical record. Put simply, economists have not agreed upon the effects of rail regulation nor, at a more basic level, have they agreed upon a theory of the goals and behavior of ICC rail regulation.

MacDonald discussed the shifts away from single car shipments and toward multiple car and unit train movements. Alternatives for measuring rate development were reviewed, given the larger and growing share of grain movements under negotiated contracts. The analyst has three alternatives. First, one can use existing tariff rate information in the hope that movements in tariff rates mirror movements in contract rates. Second, one can use grain price spreads between country elevators and port elevators as an implicit measure of transportation rates. In competitive elevator markets, grain price spreads should, in equilibrium, not exceed the cost of transportation (otherwise arbitrageurs could profitably exploit the differential). The third alternative, used by MacDonald in his paper, is to use rates derived from revenue, distance, and mileage data from the ICC Waybill Sample. Waybill revenues are the railroad's best expectation of revenue from a shipment.

Three studies of price spreads were then reviewed. They suggested that rate developments have been largely driven by three factors: exports, increasing shipment sizes, and the introduction of interrail competition. The influence of each varies across transportation corridors.

MacDonald concluded that we've had significant rate declines on most export corridors since passage of Staggers. The causes of the declines are less clear, but he suggested that traffic shifts, larger shipments, reduced export

demand, and increased interrail competition have each played important roles, and that the significance of each varies across commodities, regions, and corridors. We do not yet have a complete picture of the direct influence of each on rates, of the interaction of these causes with each other, or of the precise effects of deregulation on them. With more experience with the data and the models, we should make more progress on these fronts.

We have only begun to investigate the process of interrail competition under deregulation, and the influence of such institutions as contracting on the process. Econometric and experimental methods, used in recent years to study competition in oligopoly markets, hold promise in this area.

Legislative Initiatives Related to Creating Deep Draft Ports in the United States

Michael E. Strachn reported on H.R. 6, the Water Resources Development Act of 1986. H.R. 6 is the product of over 4 years of negotiation between the House and Senate, with considerable input over the last 2 years from the administration. It addresses every aspect of the Corps of Engineers water resources program, including navigation, flood control, hydroelectric power, beach erosion control, and other purposes. The President signed H.R. 6 into law on November 17, 1986.

Primary features of the bill related to port development are:

- New Authorizations. Six new deep draft projects (deeper than 45 feet) would be authorized, including Mobile, AL; Mississippi River from Baton Rouge to the Gulf, LA; Texas City channel, TX; Norfolk harbor and channels, VA; Los Angeles and Long Beach harbors, CA; and New York and adjacent channels, NY/NJ.

- New Cost Sharing Formula. The cornerstone of the port development part of the new authorizations is the new cost sharing rules.

- New Port Maintenance User Charge. To partially offset Corps operation and maintenance costs, a new 0.04-percent ad valorem charge would be established, paid on cargo loaded or unloaded at U.S. ports.

- Nonfederal Construction. The bill provides for construction of new port projects by non-Federal interests, provided Federal standards are met.

- Local Port Fees. To recover costs, local port sponsors would be allowed to impose fees on vessels that benefit from the improvement associated with project construction or operation and maintenance.

- Inland Navigation Features. In a related subject, the new act also would authorize and provide a source of funding for seven new lock-and-dam facilities on the inland waterway system, thereby renovating the system of inland waterways that services much of our national system of ports.

Costs and Benefits of Creating Deep Draft Ports in the United States

G. Edward Dickey discussed water project planning criteria, which guide the planning of Federal water projects, in general, and Federal harbor improvements, in particular, in the context of traditional funding arrangements. He indicated the effect of new funding formulas on project

planning and implementation. And, he suggested some general areas of research which could contribute to improved planning and implementation of Federal harbor improvement projects and thereby improve the U.S. position in world markets.

The executive branch policy governing the planning of Federal water projects, including harbor projects, is contained in the Principles and Guidelines adopted by the Reagan administration in March 1983. Under the Principles and Guidelines, the objective is maximization of net national economic development benefits consistent with environmental protection.

With the adoption of new cost sharing formulas, Federal water planning has been dramatically altered. Indeed, one could argue that the adoption of new cost sharing formulas has achieved what has been the longstanding goal of management within the executive branch; that is, to force cost-effectiveness into the formulation of Federal water resource development plans. Examples of adjustments made as a result of new cost sharing formulas are a reduction in channel widths by as much as a fifth and the deepening of outbound channels only for projects oriented toward the export of coal. In another project, a transshipment facility located far out in the harbor was considered as opposed to deepening the existing long channel to existing dock facilities.

Dickey suggested four research areas to improve the efficiency of commercial waterways. First, there is the failure to recognize the interrelationships among the U.S. harbors for import and export traffic. Few attempts have been made to estimate cross elasticities to consider the effect of the improvement of one harbor on the volume of business at others. A second area is the measurement of the benefits of improvements. The partial equilibrium character of present-day analyses leaves much to be desired in estimating true economic benefits to be obtained from either a U.S. or world perspective. A third area is the incidence of benefits. Who benefits from improvements in our Nation's harbors? The answer lies in the nature and competitiveness of the transport industry, and of the various intermediaries between buyers and sellers, as well as the elasticity of supply and demand for each particular commodity affected. The final research issue relates to the formulation of a national investment program which would establish priorities among the potential improvements.

Port User Fees: Potential Effect on the Export Grain Marketing System

Stephen Fuller and Hector Viscencio-Brambilla evaluated the effect of deep-draft port user fees on interport competition and export grain flows. The analysis was designed to measure the effect of the various user fee options (uniform versus port specific fees, ad valorem versus weight-based fees, and costs to be recovered) on export grain flow patterns and to provide insight into potential adjustment costs which may result from the diverted grain flows.

Since the proposed user fee would be charged to loaded oceangoing vessels as they exit U.S. ports, the user fee would, in effect, increase ship rates that link U.S. ports with their foreign markets.

The authors' analyses generally showed that likely port user fees would be small. At most grain ports, either weight or ad valorem-based fees which recover operations and maintenance expense would be less than 1 cent per bushel. If charges designed to recoup authorized new construction and

maintenance expenses were implemented, charges would average about 2 cents per bushel. Although the average fee is generally small, the fee size varies substantially among ports.

The port user fee will not have a major effect on agriculture since the estimated unit fee is quite small. In most cases, a port's relative cost advantage or disadvantage that results from imposition of a user charge is not large. Therefore, in the short run, a port's cost disadvantage is likely to be partially absorbed by lowering the rate of return on capital investment, thus minimizing abrupt disruptions in trade flows.

Rural Roads and Bridges: Necessary for the Nation's Growth and Competitiveness

Deterioration of the Nation's rural road system, according to Ruth T. McWilliams, is a national problem affecting rural America. Transportation accessibility, which includes time, cost, convenience, dependability, and safety factors, affects rural America's economic development potential and competitiveness in the world market.

The demands on the rural road system are changing largely in response to the changing patterns of production and mobility associated with our nationwide integration of economic activity and international trade. Much of the rural road system provides for the direct and immediate access to basic commodities from the farms, mines, and forests which underpin much of the Nation's industrial and economic strength. There is increasing evidence of the inadequacy of the rural road system to meet these demands.

Individual States and localities have unsolved access problems which affect their development potentials. And, the Nation's growth, prosperity, and competitive position also are affected. Although the number of miles traveled and the volumes of traffic are relatively low in rural areas, the products transported over the rural road system are critical.

Solutions to the problems will vary by State and locality, but financing is clearly the primary issue facing all levels of government. The critical needs will have to be defined so that the available resources are spent on the most needed and beneficial improvements. Improving the access to rural America will involve conducting more meaningful and directed research, restructuring the governmental responsibilities so that improvements can be made in a timely and efficient manner, and actually rebuilding the system to serve the needs of agriculture and the other centers of rural production.

SUMMARY OF PAPERS ON OCEAN FREIGHT MARKETS IN TRANSITION

James R. Snitzler

A Survey of Maritime Cargo Protectionism in U.S. Foreign Trade

Robert C. Waters reported that in 1982 Japanese vessels moved 55 percent of total U.S. exports to Japan, while U.S. vessels moved less than 30 percent. In contrast, countries with stated cargo reservation restrictions and bilateral cargo sharing agreements with the United States (Venezuela, Brazil, Israel, and Argentina) moved more than 30 percent of outbound liner trade in ships flying their national flag. In each case, U.S. flag vessels also moved

more than 30 percent but slightly less, by value, than the trading partner. Contract carriage movements (nonliner vessels) of U.S. exports show that the People's Republic of China vessels moved 32 percent of the cereal grains which the PRC imported from the United States, while Japanese vessels moved 40 percent of the logs and wood products which Japan imported from the United States. P.L. 480 Title I and Title II cargo preference programs, administered by USDA, moved about 3.5 million tons in 1985, equivalent to about 35 percent of the total cargo preference tonnage moved in that year. The cost of the ocean freight rate differential on Title I and Title II programs (the difference between the ocean freight rate of U.S. flag vessels versus foreign vessels) was $98 million in 1985.

Maritime Policies and Agricultural Exports

Peter A. Johnson stated that ocean freight costs are significant and variable and are vulnerable to forces such as governmental actions on cargo policies. The current worldwide trend is toward more government involvement in trade through unilateral declarations and bilateral and multilateral agreements. The United States strongly advocates free trade. At the same time, the U.S. cargo preference programs are considered vital to the health of certain segments of the U.S. merchant marine. Two new U.S. policies will affect the merchant marine: (1) cargo preference increases from 50 percent in 1985 to 75 percent in 1988 on P.L. 480 programs, and (2) the nonapplicability of cargo preference to the blended credit program. Thus, policies should be monitored to ensure that they provide the intended support to industries faced with unusual foreign competition.

Effects of the Shipping Act of 1984
Monopoly and Competition

The Shipping Act of 1984 greatly reduced the role of the U.S. Government in the regulation of liner services in the U.S. trade with other countries. However, Allen R. Ferguson questioned whether the act has increased monopolistic or competitive forces in the liner trades. A summary of some of the effects of the act follows:

- The number of conferences serving U.S. trade with Europe and Asia dropped dramatically from 37 in 1984 to 10 in 1985, which indicates a trend toward lessening competition.3/

- The filing of service contracts started at a low level in the first half of 1984, then rose rapidly in 1985 to over 1,000 contacts signed between October and December. A monthly peak of 396 filings was reached in January 1986. Almost all of these contracts were by independent carriers, thus reflecting vigorous competition.

- Independent action, generally believed to be of importance in depressing or constraining increases in rates, is closely associated with innovations. In the 2 years since the passage of the act--and for several

3/ A conference is a group of carriers banded together voluntarily for purpose of limiting and regulating competition among themselves. It may establish uniform tariff freight charges and terms and conditions of service. In the United States, establishment of a conference requires Federal Maritime Commission approval. When approved, authorized activities are provided antitrust exemption.

years before--service innovations have been introduced at a rapid rate. In most cases, special service arrangements have been agreed upon independently by individual carriers.

- Liner capacity between 1980 and 1985 increased greatly, especially in the Transpacific Westbound Rate Agreement (TWRA) Conference with members investing about $6.3 billion in capacity. Much of the force behind the increase in capacity was economies of scale through construction and operation of larger and technologically superior vessels. Many industry sources believe, however, that the substantial capacity increase has been uneconomical in that it has exerted downward pressure on rates. This, in turn, has forced longstanding members out of particular trading routes and placed others in financial difficulties.

- The pervasiveness of excess capacity may well totally obscure the underlying effects of the act. Nevertheless, there were no strong indications at the end of 1985 that the act had greatly strengthened conferences and reduced competition. A somewhat different picture is apparent for 1986. For example, conferences in the Pacific trade appear to have seized control of service contracts, conference loyalty contracts are reemerging, and efforts are being made by the conferences both in the Pacific and Atlantic trades to raise rates.

Quality Deterioration During Transportation and Handling of U.S. Grain Exports

Lowell Hill reported that research at the University of Illinois shows that quality deterioration in the export of U.S. grain to overseas markets can be attributed to three basic problems: (1) increased breakage at each point where the grain is handled, (2) moisture levels that cause deterioration in the barge or ocean vessel, and (3) segregation by particle size during loading and unloading. Although transportation and handling of grain from farm to final destination can have a profound effect on the quality of grain delivered to the foreign user, the responsibility for the quality losses, with few exceptions, does not reside with the transport firm or even the grain handlers. The current system of grades and pricing practices fails to provide economic incentives for maintaining grain quality.

Effects of the Shipping Act of 1984 On Liner Services

One objective of the Shipping Act of 1984 was to reduce government intervention in the ocean shipping marketplace by streamlining the agreements process so that carriers would be less reluctant to develop and file agreements which they believed would be in their self-interest. The new act, according to Sandra L. Kusumoto, permits carriers to react to market conditions without bureaucratic delays. It also clarifies antitrust immunity for liner companies, and provides more freedom from oversight by the Department of Justice. Conferences are also able to offer intermodal through rates which are used extensively by such companies as Dupont. Service contracts are permitted by the act, with the essential terms treated as confidential. The service contracts can be offered by both conference and independent lines. Carriers are divided on benefits. Some carriers believe independent action leads to rate volatility; others appear to favor it. Although some interests are calling for changes, the act has been in effect for too short a period for anyone to determine if any changes are needed.

Forecasting Ocean Freight Rates

Most tonnage of U.S. agricultural exports is low-valued and bulky. Thus, cost of shipping is a significant portion of the delivered price. Variability in ocean freight rates can have an important effect upon the stability of international markets, which in turn can affect domestic markets. The objective of research by James W. Dunn was to determine the shortrun behavior of ocean freight rates to more accurately forecast the level of such rates. Dunn examined longrun modeling for forecasting freight rates but found three basic difficulties: (1) changes in technology and practices, (2) insufficient or inconsistent data, and (3) the inadequacy of economic theory for empirical modeling of capital-goods markets. Research needs identified were:

- Shortrun behavior of ocean freight rates to include interactions between related commodities such as oil, coal, iron ore, and phosphate.
- A better understanding of the shortrun supply of transport.
- An analysis of the intermediate-run issue of layups and the degree of flexibility it introduces to understand the shortrun dynamics of rates.

Use of Freight Rate Futures to Hedge Against Freight Rate Increases in the Dry Bulk Freight Market

Barry D. Parker described how a futures market in ocean bulk shipping can be used by agricultural shippers to minimize costs. He demonstrated volatility in the market by showing a dramatic peak in future contract grain rates as a result of the USSR Chernybol disaster. Traders anticipated a strong demand for grain, and thus a shortage of shipping. Ocean freight rate futures on an index of 13 spot dry bulk freight rates (The Baltic Freight Index or BFI) began trading on May 1, 1985. Futures contracts are traded on two exchanges: the Baltic International Freight Futures Exchange (BIFFEX) in London and the International Commodities Exchange (INTEX). Research is needed to demonstrate the benefits of freight rate futures to small as well as large shippers.

SUMMARY OF PAPERS ON INFRASTRUCTURE DEFICIENCIES IN IMPORTING COUNTRIES

James R. Snitzler

Improving Grain Distribution in Latin America: Can It Increase U.S. Exports?

If the goal is to increase the export volume of U.S. agricultural exports, James Caron and Keith A. Klindworth suggest that improvements in grain distribution should be targeted to countries that (1) are already demonstrably U.S. markets, and (2) have an apparent need for infrastructural improvements. They identified 10 countries in Latin America and the Caribbean that meet these requirements: Honduras, Guatemala, El Salvador, Jamaica, Haiti, Dominican Republic, Costa Rica, Ecuador, Peru, and Bolivia. Research under these criteria has been completed in Honduras, Guatemala, and Ecuador, with additional research scheduled for Guatemala. This research centered upon the need for improving port infrastructure and related facilities to increase bulk grain throughput arising from the PL-480 program. Additional research is needed on the linkage between U.S. exports and investment in a trading partner's agricultural distribution needs.

Infrastructure Deficiencies in Africa: Overview of Current Conditions

Charles G. Vandervoort identified numerous infrastructure deficiencies associated with the transportation network of East, West and Southern Africa which have adverse effects upon the transportation of agricultural products within and between the African countries. Among these deficiencies are:

- Lack of intergration of the transportation network.
- Varying railway gauges among countries.
- Little or no priority given to constructing and maintaining transportation links near borders that would not be of direct benefit to the particular countries involved.
- Lack of commitment by many African governments to provide the necessary infrastructure to serve rural areas in contrast to urban areas.
- Numerous political and economic barriers imposed by the various governments that serve as major obstacles to transportation in Africa.

Unless the developing countries of Africa can improve the efficiency of their transport systems through more enlightened administration and encouragement of the private sector, transport costs in the international sector are likely to increase substantially. The greatest research need is in the institutional area aimed at improving the efficiency of transport systems. An additional need may lie in the technical area, such as speeding up the unloading of bulk carriers.

Developments in Trade and Associated Transport Between Industrialized and Developing Countries, with a Specific Reference to the Pacific Basin

Hans Peters reported that seaborne world trade has been subject to wide fluctuations in the post-World War II period. It expanded rapidly from about 1 billion metric tons in 1960 to 3.25 billion metric tons in 1974. It experienced a decline in 1975, following the oil crisis of 1974, and then began to recover slowly until it reached a peak in 1979 of nearly 4 billion metric tons. That year, with the start of the worldwide recession, seaborne trade began to fall rapidly. By 1983, it had declined below 1973 levels. World cargo volumes fell in 1985 and the early months of 1986 largely as a result of the deteriorating U.S. dollar and attempts by the industrialized and the developing countries to contain worsening trade balances. Unprecedented changes have occurred in the international transport industry over the past 15 years:

- The development and expansion of containerization in which world container volumes increased fivefold from 1970-85, with developing and industralized countries sharing in this growth. Future expansion, however, is expected to drop to growth rates approximating those of ports' natural rates.
- The introduction of intermodalism for container services has allowed door-to-door services far beyond the port perimeters. International shipping has been brought onto the domestic scene.

- Load centers have been developed by the major international container carriers. These centers greatly reduce the number of port calls by amassing in or distributing from the load centers through feeder services from or to surrounding ports.

- Advances in ship design, shipbuilding arrangements, and engine design plus reductions in crew and maintenance costs have signaled a cost cutting revolution in capital and operating costs for major ocean carriers. Capital costs for new Far East built Evergreen and U.S. line vessels are as much as 75 percent lower than those typical in 1980.

- Container traffic has rapidly penetrated Asia's Pacific Rim countries. Container traffic in this region grew to 80 million tons by 1982, which represented an increase of 500 percent over similar traffic for 1972. Some analysts have predicted that this volume will top 174 million tons by 1990.

A number of transport sector issues have surfaced in Asia's Pacific Rim countries, pointing to potential conflicts between the countries' national objectives and international practices. At the same time, there appears to be a growing awareness that maritime sector development policies in all regional economies need to be integrated and coordinated at national, subregional, and regional levels.

PLENARY SESSION HIGHLIGHTS

Velmar W. Davis
James R. Snitzler

During the plenary session, the 17 invited papers on domestic and international transportation issues were briefly summarized. Then, the session was opened to comments and suggestions regarding transportation issues and research priorities. The following research priorities suggested by symposium participants are in addition to those research needs identified by invited papers.

Pipeline Transportation of Natural Gas and Liquified Petroleum

Neither the domestic nor international aspects of this mode of transportation were discussed. Most people do not consider pipelines a mode of transportation. However, in terms of agriculture, it is an area that should be considered. This is especially so since natural gas is an important input to American agriculture. The regulatory reform related to natural gas transportation should also be considered as part of this research.

Hazardous Materials

These materials greatly affect rural agriculture, not only in terms of the products that are being moved, but also the safety hazard. The transportation of gasoline is a safety issue. Truckers note the insurance problems of transporting gasoline. Gasoline is important to every U.S. farmer and yet it is one of the most cited cases in truck accidents.

State Public Service Commissions and State Departments of Transportation

The Public Service Commissions are becoming more important because of the unfavorable financial situation of our country today. State Departments of Transportation must now be concerned more about truck size and weight. More control is being delegated by the Federal Government to States and local areas. We need to do more research on the shift toward State and local control, especially on truck weights and their effects on road systems.

Economics of Alternative Design Standards for State and Rural Road Systems

This has largely been an area in which engineers have worked without economists. Both disciplines should work together to develop appropriate design standards and costs.

Trucking Industry Deregulation

The trucking industry can still set rates collectively while railroads cannot. The entry restriction on new trucking firms has been lessened to a great degree, but it was suggested that it should go further.

Competitiveness of U.S. Agricultural Exports

Competitiveness should be examined in a systems perspective. It includes looking at the movement of commodities from the point of production to the point of consumption, examining all the segments along the way to determine the most efficient way of handling. The intermodal alternatives should always be kept in mind rather than focusing too narrowly on mode-specific types of research. We need to know about rail rates and ocean tariffs and a lot of work has been done in those areas. But from a policy perspective, we need to be able to say something about the competitive position of products and the effect of the total transportation cost on those products. Total transportation costs include a lot of things that happen between the farmgate and the final consumer, particularly foreign consumers.

Containerization

Containerization is a valuable technique going back about 50 years. It is generally too expensive to ship containers overseas, then ship them back empty. With the increased flow of goods in containers from Japan, there have been more opportunities to use containers. It was reported that the Japanese are shipping auto parts in containers into Ohio and running a back haul for those containers. A speaker at the recent Transportation Research Forum meetings talked about the imbalance of goods flowing out of the Far East (primarily Japan) into the United States at about a 3-to-1 ratio. So, a lot of empty containers are going back that could be used to ship soybeans at a reasonable rate. The Burlington Northern is looking at moving grain out of the Upper Midwest in containers. The marginal cost of fitting grain in them is an obvious winner but there must be other impediments. They are discussing it now because they have a lot of empty ones going West. The economics of containers and possibly some new engineering techniques of designing containers as well should be reassessed.

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